OpenCable™ Applications Platform (OCAP™)

November 14, 2005

FCC

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Agenda

- How did we get to OCAP™?
- How does OCAP™ work?
- What is the status of the project?

OCAP™ Background

- “We are relying on the relevant industries to make progress towards achieving portability .... If they do not, or if the effort is unduly delayed, it will be necessary for the Commission to consider whether further action is necessary." [Navigation Device Order (1998)(para. 132)]

- Trials retailing non-portable STBs were unsuccessful

What is OpenCable™?

- Separated Security
  - CableCARD™
- Software Platform
  - Middleware: OCAP™
  - Headend and Network support

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OCAP™ Background

- Portability
  - Benefits to consumer
    - STB, TV or PC purchased at retail can be used at any location with any MSO
    - Market competition will result in lower cost hardware for consumers
  - Benefits to Application Developers, Networks
    - Nationwide and common software platform will result in scale economies for interactive services
    - Write once and run everywhere becomes possible
  - Benefit to MSOs
    - Good competitive response to DBS, Telco

How best to achieve Portability?

Portability Options – 1999 Decision

Option A: Middleware

Standardized middleware

Applications written to one standard Interface

- Greater design flexibility (MSO, Apps, CE)
- Fewer Intellectual Property problems
- Faster innovation
- Better stability

Option B: Protocols

Standardized “protocols” for each new feature

Each app written to corresponding feature protocol (multiple)

- Greater commonality across cable industry at feature/app level
- Potential IPR issue for each new feature protocol ($, time)
- Cooperation required among MSOs for each new feature
- Each new feature subject to standards process

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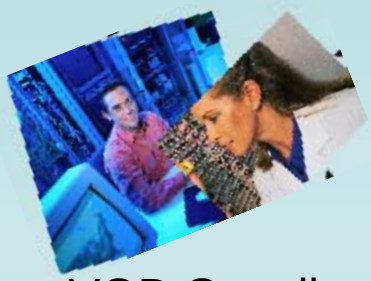
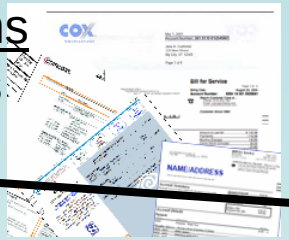
Interoperability Complexity



Billing Systems
- CSG Innovis
- Convergys
- DSG

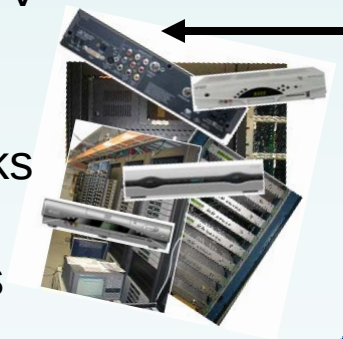


VOD Suppliers
- SeaChange
- C-COR
- Concurrent
- Broadbus
- Arroyo

Navigators/EPGs
-GuideWorks
-TvWorks
- Passport
- SARA
- Mystro
- Optimum

Third Party Applications
- GoldPocket / Tandberg
- BIAP
- Bluestreak
- TVWorks
- Zodiac
- Navic
- Visiware

Set Top Box OS
- PowerTV
- VRTX
- Linux
- VxWorks
- OS20
- Aperios



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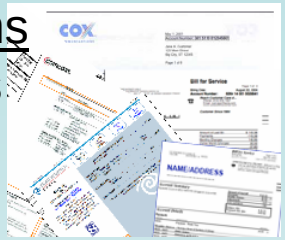
Interoperability Complexity Solution

Billing Systems
- CSG Innovis
- Convergys
- DST



Navigators/EPGs
- GuideWorks
- Passport
- SARA
- Mystro
- Optimum

VOD Suppliers
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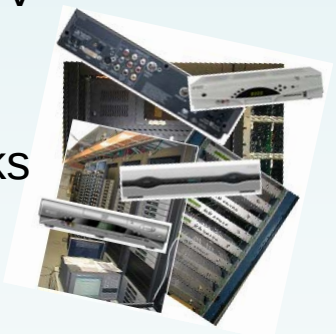
Common Middleware

Set Top Box OS
- PowerTV
- VRTX
- Linux
- VxWorks
- OS20
- Aperios



Plug and Play

Third Party Applications
- GoldPocket / Tandberg
- BIAP
- Bluestreak
- TVWorks
- Zodiac
- Navic
- Visiware

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Middleware Solutions Examined

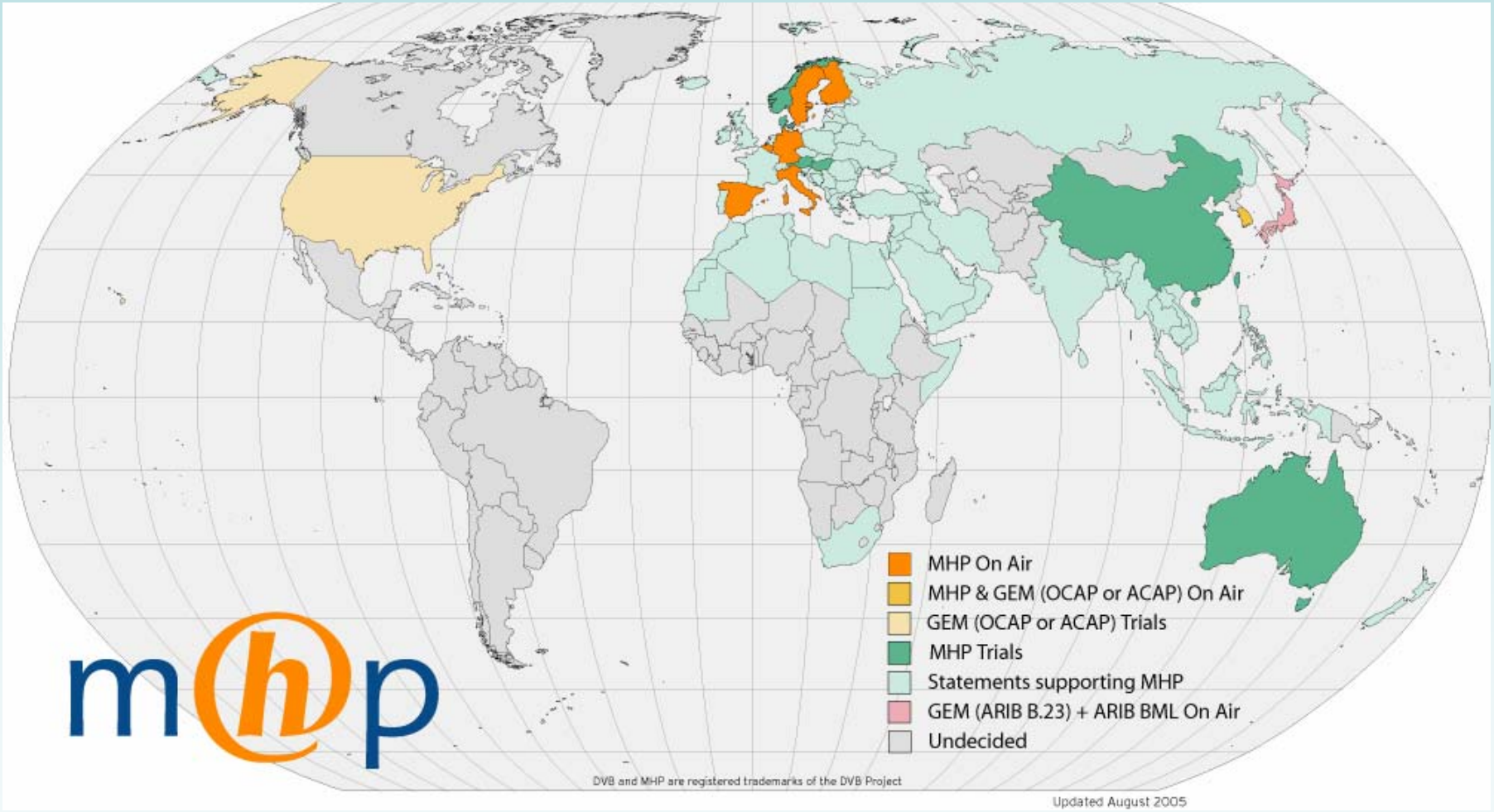
1	ACTV	9	Microsoft
2	Adv. TV Sys. Comm.	10	MoreCom
3	Canal Plus	11	NDS
4	Excite@Home	12	OpenTV
5	General Instrument	13	PowerTV
6	Hewlett-Packard Co.	14	Sun Microsystems
7	ICTV	15	Virtual Modem
8	Liberate	16	VXM Network

Logic of JAVA-based Middleware

- Limitations of Presentation Engine approach
  - Market examples
    - ATVEF
    - WebTV, Wink, Liberate
  - Customers want a TV-centric user interface, look & feel

- Execution Engine approach
  - JAVA based
  - Adopted by Europe, Asia with DASE, MHP
  - Adopted by Cell phone industry in JAVA phones
  - Broadcasters and CE industry reached same conclusion on ACAP standard

What's the Rest of the World Doing?



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Current OCAP™ Services

- S. Korea cable operators have begun commercial OCAP™ services in 2005

Mosaic EPG

SMS Messaging App

Examples of Current OCAP™ Services

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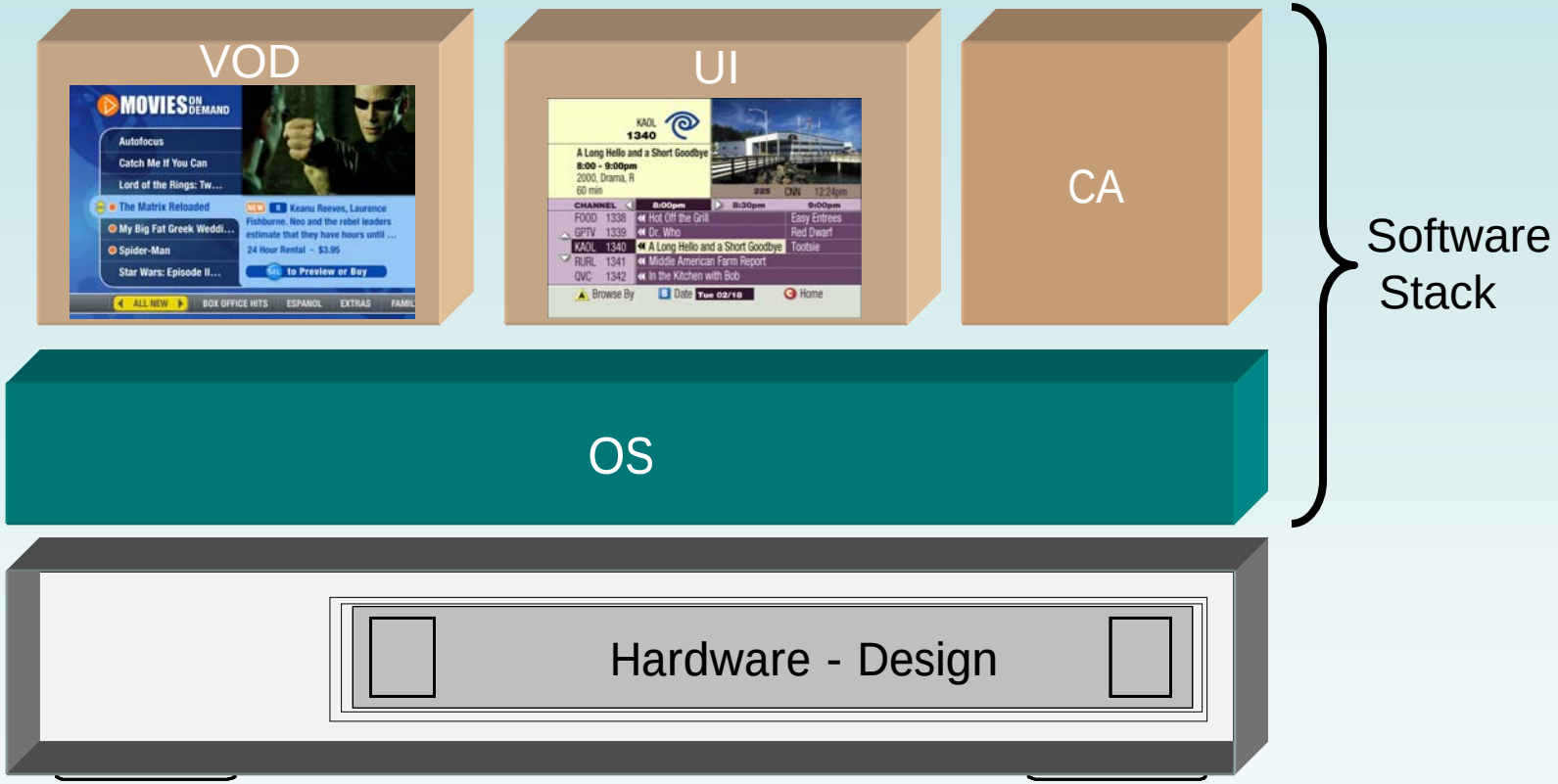
Leased STB



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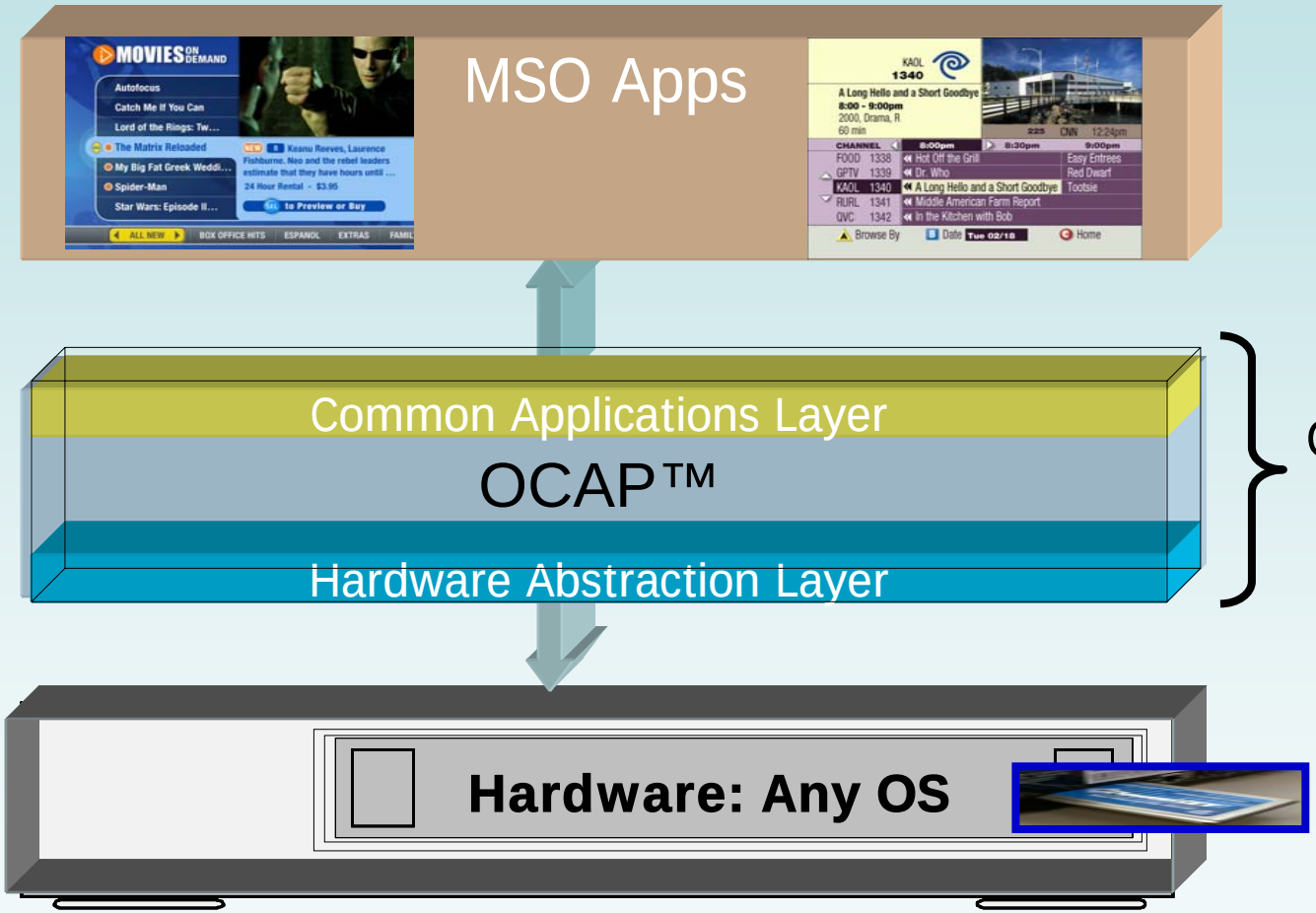
Plug & Play / Uni-Directional

Separates Security

MSO UI and Software Applications replaced with CE UI

Plug&Play-Bi-directional /OCAP™



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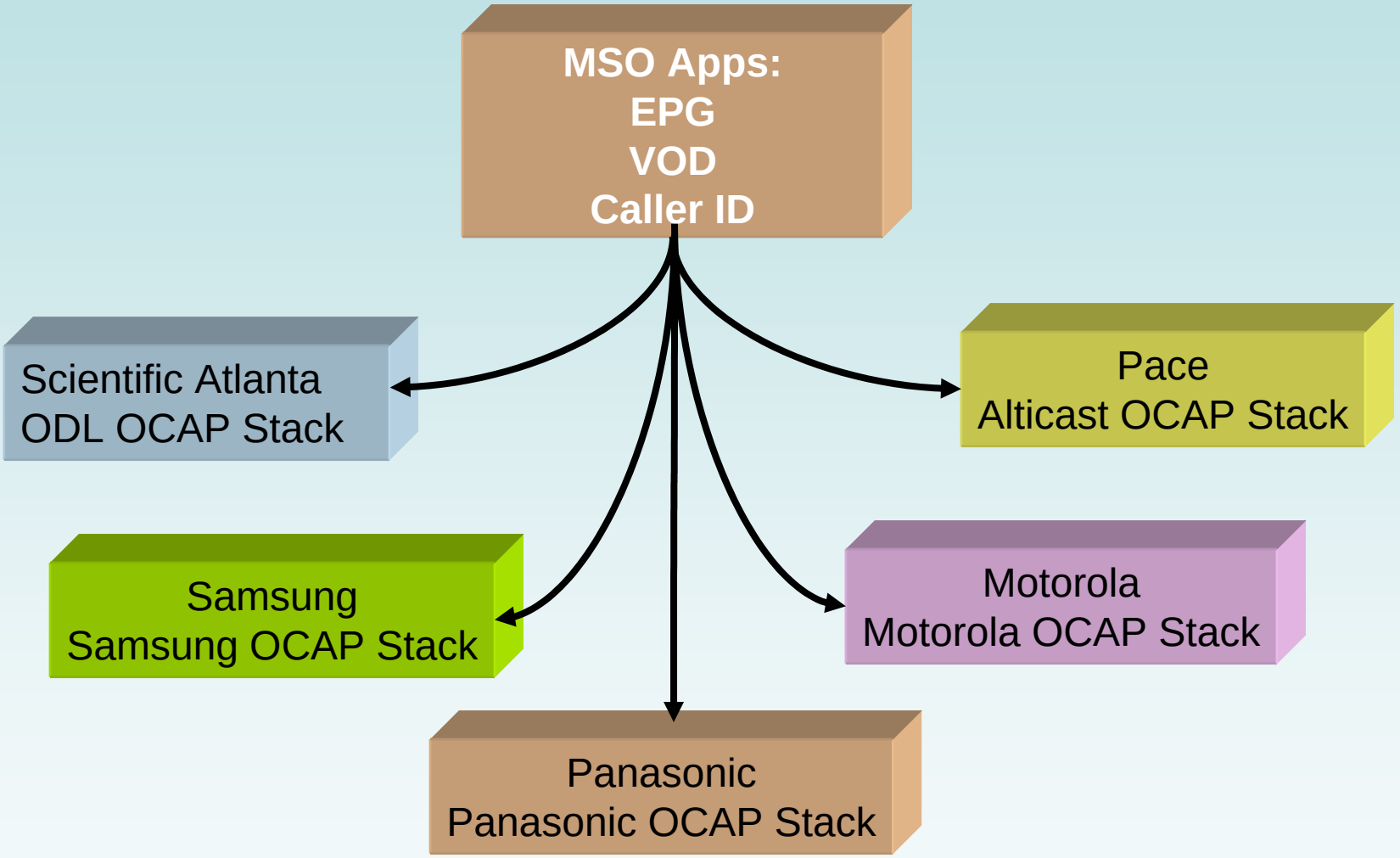
Interfacing to MSO Apps



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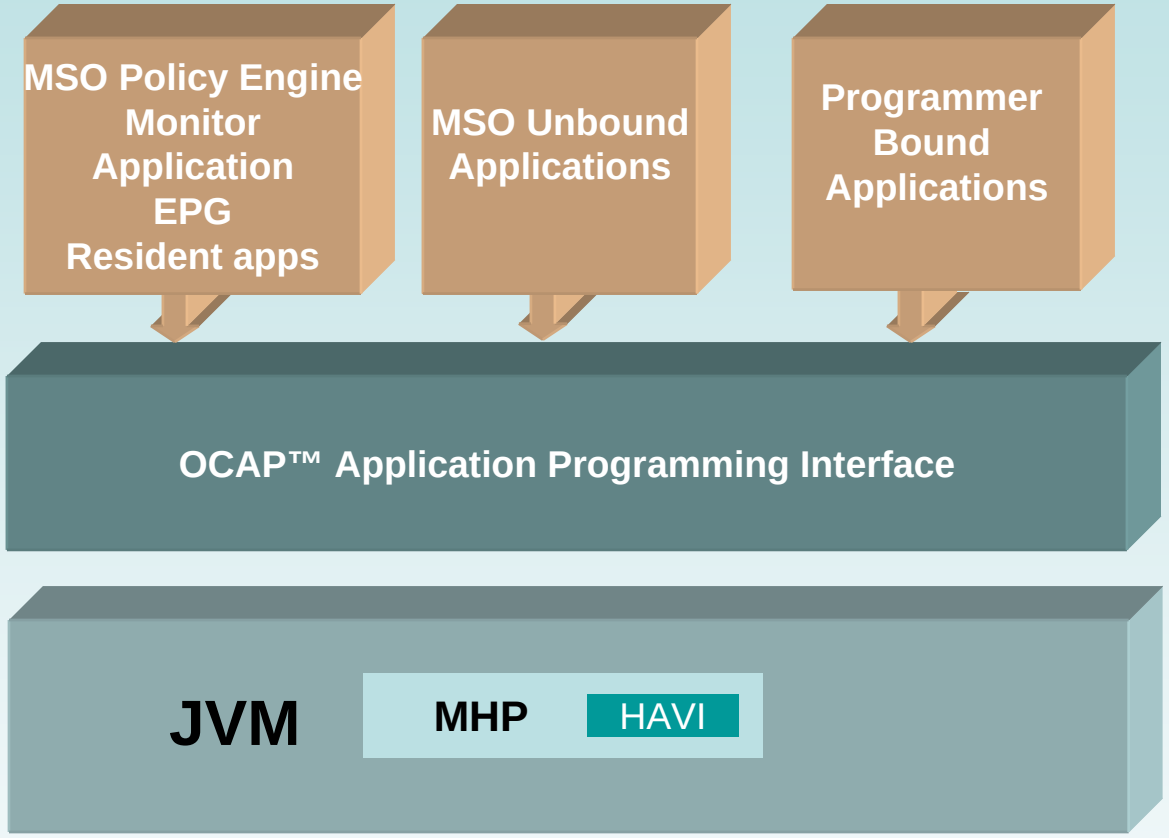
OCAP™ Layers



OCAP™ Implementation

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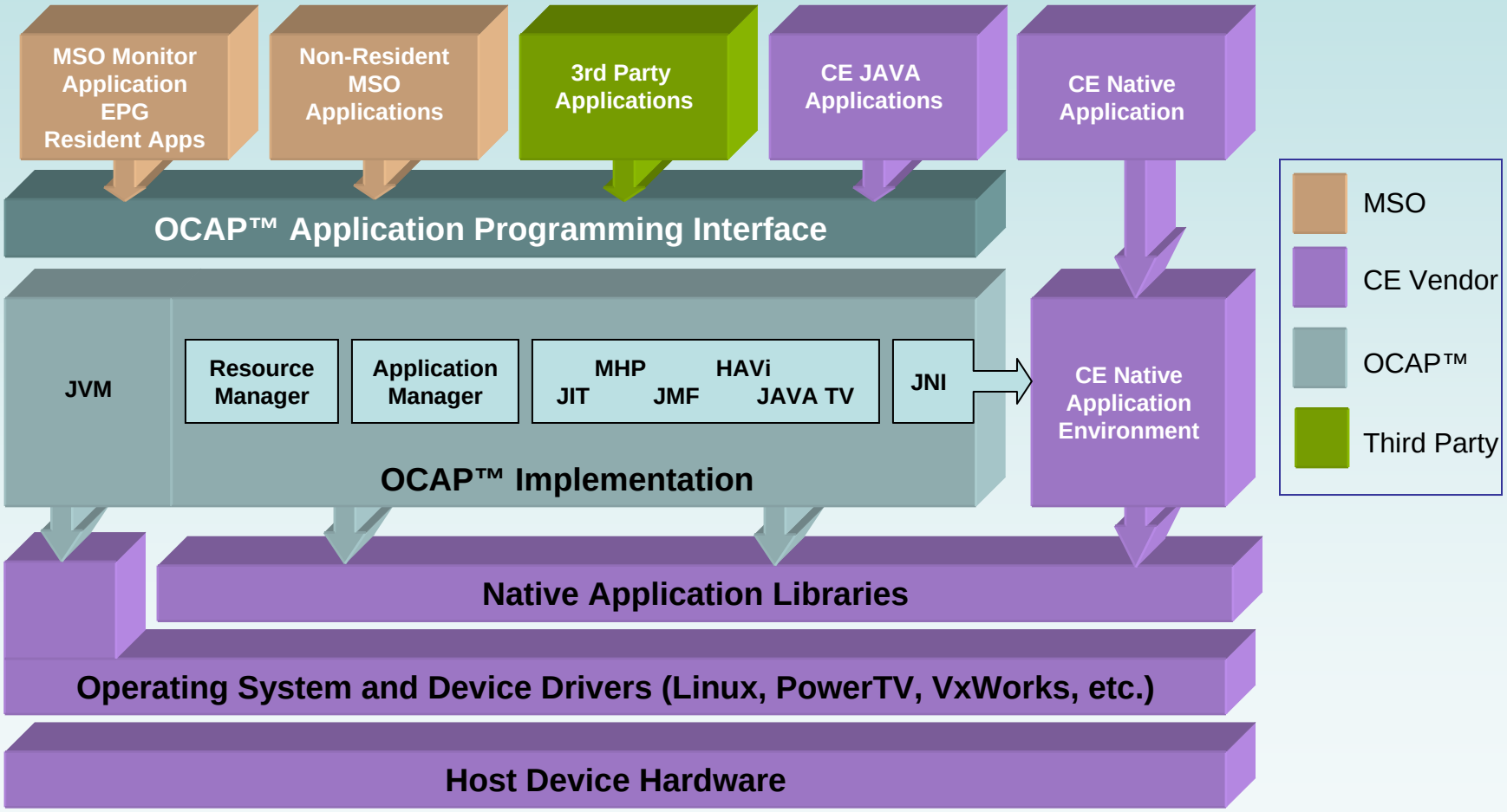
OCAP™ 1.0 Software Stack



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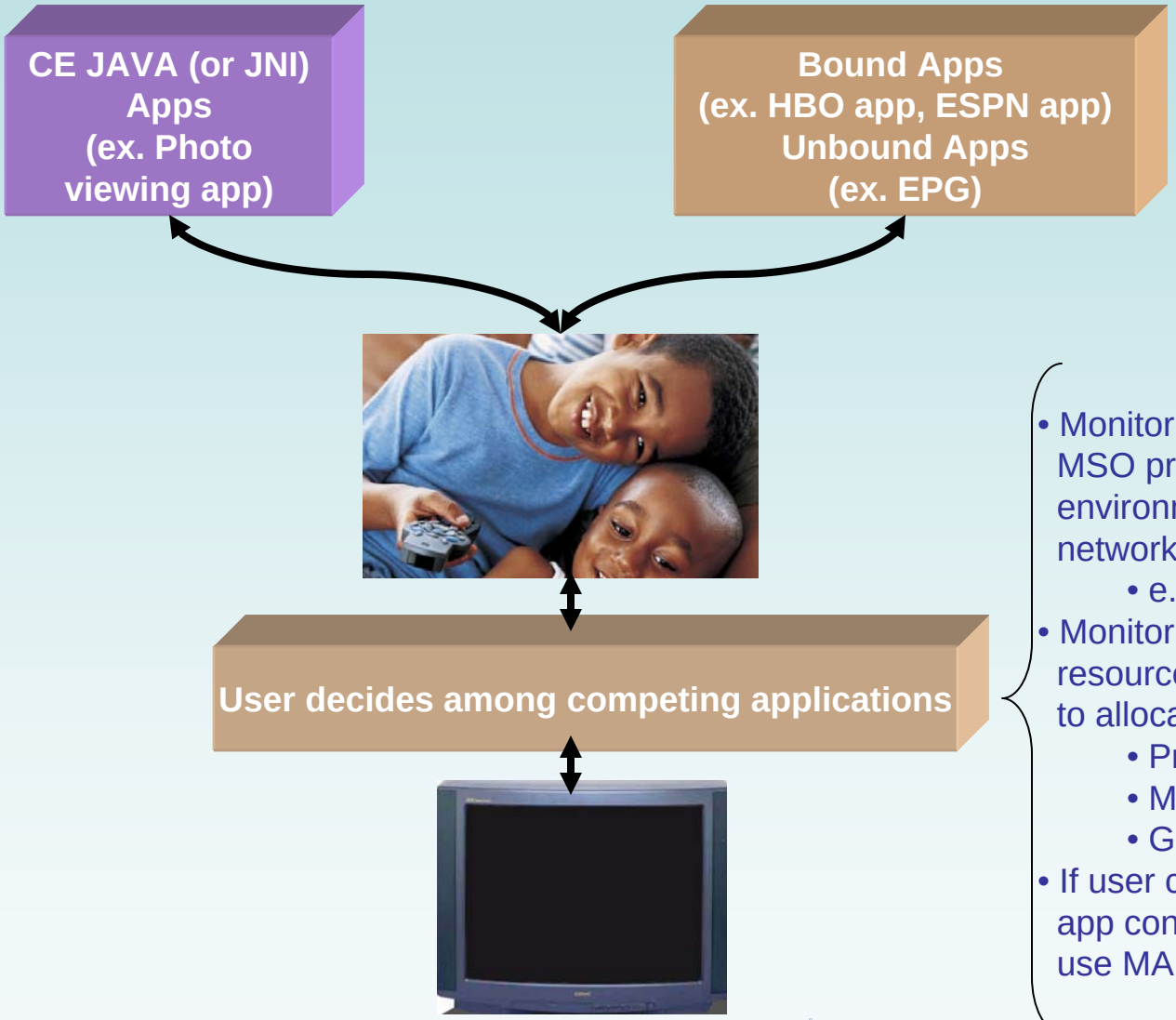
Why a Monitor App?



- Monitor app helps MSO provide consistent environment (due to MSO network-specific services)
  - e.g. configure EAS
- Monitor app reacts to resource contention to allocate
  - Processor Cycles
  - Memory
  - Graphics Plane
- If user choice of CE JAVA app conflicts, MSO may use MA to alert customer

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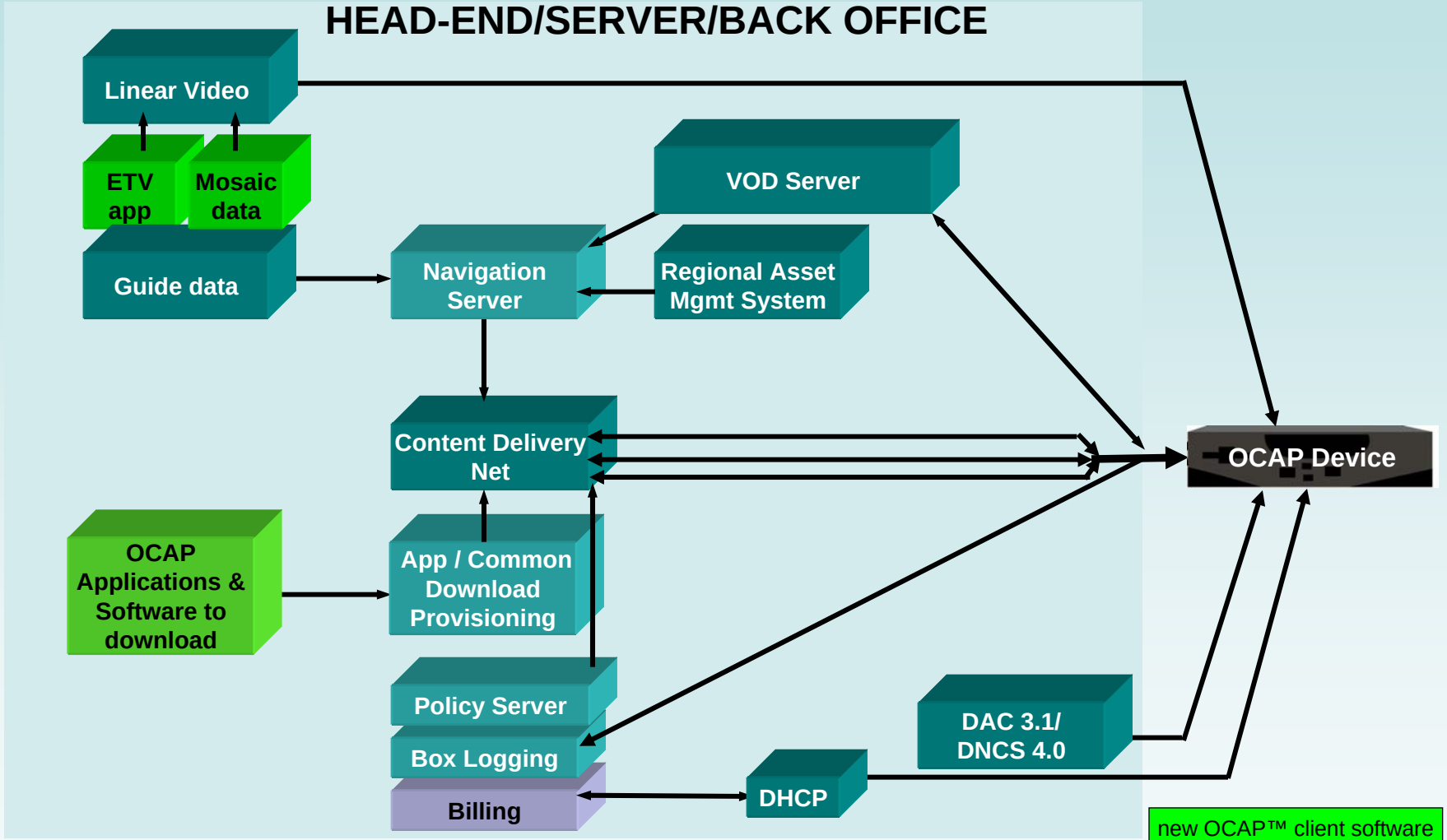
OpenCable™ Headend & Network



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Cable's Economic Incentive for OCAP™

- More Application Innovation on Cable Platform
  - National Platform for Cable
  - Programmers, Advertisers, Third Party Developers
  - Competitive response to DBS, Telcos
- Capital Reduction
  - Consumers purchase own CPE
  - Reduces Underlying Hardware Cost
  - More competition among STB suppliers

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Cable's Economic Incentive for OCAP™

- Operations Efficiency, cost savings
  - De-couple Hardware from Software
  - Move to one Applications stack
  - Buy Hardware and Software from different suppliers
- Potential market share gains
  - Better Cable Presence at Retail
  - Win back DBS, Telco customers
- Increase "Digital Cable" Penetration

Progress to Date

- CHILA signatories
  - Samsung
  - Panasonic
  - LG
  - Digeo
- Substantial Investment by N American MSOs
  - UI porting to JAVA
    - GuideWorks
    - Time Warner Cable Digital Navigator
  - Headend equipment upgrades & purchases
  - Joint middleware development
  - Work with CHILA signatories
  - Creation of new specification for enhanced services

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Widespread Participation

- Interoperability Workshops at CableLabs®

Application
- ABC
- Starz!
- GuideWorks
- TWC Dig Nav
- TVWorks
- Pixel Play
- Zodiac
- NPTV
- Aptiv Digital
- Cox

Headend
- DigiSoft
- S&T
- Softel
- Thales
- Unisoft

Tools
- Emuse
- Ensequence
- Extensible Formatting

Implementation
- ADB
- Alticast
- Comcast
- LGE
- Motorola
- NDS
- Osmosys
- Pace
- Panasonic
- Pioneer
- Samsung

Continuous Spec Development

- Thriving ECR process
  - 248 refinements to spec ’04,’05
  - 21 companies participating
- Open process
- Extensions to embrace new innovations
  - DVR
  - Home Networking
  - IP Tuner (IPTV)
  - Downloadable Security
- Continued MHP, ARIB harmonization

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OCAP™ Works

- OCAP™ allows us to meet consumer expectations
- Practical solution to a difficult problem
- Platform for innovation

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